



January 3, 2018

Project No.: 943-6222-14

via e-mail

Ms. Alice Yeh, Remedial Project Manager
Chief, New Jersey Superfund Branch
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

**RE: SUMMARY OF 2017 ANNUAL GROUNDWATER MONITORING EVENT
216 PATERSON PLANK ROAD SITE– OPERABLE UNIT 3 (OU-3)
CARLSTADT, BERGEN COUNTY, NEW JERSEY**

Dear Ms. Yeh:

On behalf of the 216 Paterson Plank Road PRP Group (Group), this letter summarizes the results from the 2017 Annual Groundwater Monitoring event for Operable Unit 3 (OU-3) at the 216 Paterson Plank Road (Site), located in Carlstadt, NJ.

The annual groundwater sampling event was conducted in accordance with the monitoring program detailed in the approved OU-3 Pre-Design Investigation (PDI) Report. A total of 33 monitoring wells were sampled in the period June 19-23, 2017. Samples from certain wells were not analyzed by the laboratory for VOCs within the required hold time, and those monitoring wells were re-sampled for volatile organic compounds (VOCs) on August 3, 2017. All monitoring wells were sampled for VOCs, eight monitoring wells were sampled for metals, 18 monitoring wells were sampled for 1,4-dioxane, and 11 monitoring wells were sampled for monitored natural attenuation (MNA), parameters as specified in Table 3 of the PDI Report. Analyses were conducted by TestAmerica Laboratories, Inc.

Monitoring wells were sampled by using low-flow groundwater sampling methods in accordance with the Site-specific Quality Assurance Project Plan (QAPP) and the NJDEP Field Sampling Procedures Manual. Field parameters, including dissolved oxygen, pH, specific conductivity, turbidity, and temperature were monitored during purging and the results immediately prior to sampling are included in Table 1.

The validated analytical results from the sampling event are provided in Table 2 and summarized in Figures 1 and 2. A USEPA format EDD is provided on the enclosed CD. Groundwater sampling results were generally consistent with those from previous sampling events, as noted below:

- VOCs concentrations were very low in all bedrock monitoring wells except for MW-11R (total VOCs: 173 µg/L). However, significant reductions in concentrations of VOCs were observed in MW-11R and especially MW-13R since the 2016 sampling event (see Figure 2).
- Total VOCs in the majority of the till wells declined from the 2016 sampling event, with the exception of MW-29D where concentrations significantly increased.
- Elevated concentrations of 1,4-dioxane were confirmed in the southern area of the site, most notably in monitoring wells MW-21D and MW-22D. 1,4-dioxane was sporadically detected elsewhere at low levels.
- Iron, manganese and sodium were consistently detected above New Jersey Groundwater Quality Standards (GWQS).



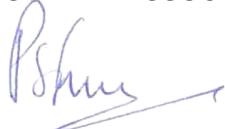
- Monitored Natural Attenuation Parameters were consistent with previous analyses, with reducing conditions evident based on the depletion of nitrate and measured oxidation-reduction potential (ORP).

The next groundwater sampling event was conducted in December 2017 in accordance with Table D4 of the Approved Final Remedial Design Report for the Northern Area.

If you have any questions regarding this summary, please do not hesitate to contact us.

Sincerely,

GOLDER ASSOCIATES INC.



P. Stephen Finn, C. Eng.
Facility Coordinator

Attachments:

- Table 1 – Groundwater Sampling Field Parameters
- Table 2 – Comprehensive Validated Analytical Data
- Figure 1 – Till Groundwater Quality
- Figure 2 – Bedrock Groundwater Quality
- CD – EPA format EDD

Table 1
Groundwater Sampling Field Parameters
Annual Groundwater Monitoring Event
216 Paterson Plank Road Site
Carlstadt, Bergen County, New Jersey

Parameter	DO	ORP	pH	Specific Conductivity	Temperature	Turbidity		
Well ID	Date Sampled	Unit	mg/L	millivolts	S.U.	ms/cm	°C	ntu
OU-3 Annual								
MW-5D	6/21/2017		5.52	IE	7.95	1.71	21.48	8
MW-11R	6/20/2017		0	IE	9.26	0.333	20.46	3.3
MW-13R	6/20/2017		0	-268	9.62	0.291	20.53	23.6
MW-14D	6/23/2017		0	IE	9.89	1.46	23.99	5.9
MW-14D	8/3/2017		0	-192	9.34	2.5	20.93	5.1
MW-14R	6/23/2017		0	IE	8.75	2.14	22.3	29.5
MW-14R	8/3/2017		0	IE	8.61	3.01	20.94	51.5
MW-16D	6/22/2017		0	-135	8	0.874	20.62	71.3
MW-17D	6/22/2017		0	IE	7.45	2.12	20.15	3.4
MW-18D	6/22/2017		0	IE	7.32	2.34	16.84	7
MW-19D	6/22/2017		4.45	34	10.57	0.593	19.08	5.7
MW-19R	6/22/2017		0	-224	8.15	0.121	19.63	80.4
MW-20D	6/19/2017		0	-164	8.71	1.75	22	4.7
MW-20R	6/19/2017		0	-245	8.75	0.59	25.68	0
MW-21D	6/23/2017		0	-96	6.94	7.41	19.36	11.3
MW-21R	6/22/2017		0	IE	8.56	1.13	16.92	8.2
MW-22D	6/21/2017		0	-189	8.39	7.04	21.11	1.8
MW-23R	6/20/2017		0	-331	8.42	0.383	18.49	310
MW-24D	6/20/2017		0	IE	7.07	2.1	14.82	4.9
MW-24R	6/20/2017		0	IE	8.19	0.744	15.06	3.3
MW-25D	6/23/2017		0	-97	8.33	1.34	20.51	53.5
MW-25D	8/3/2017		0	IE	8.69	1.43	20.28	9.7
MW-25R	6/23/2017		0	-156	9.42	1.02	20.49	7.7
MW-25R	8/3/2017		0	IE	9.28	0.961	21.15	16.6
MW-26D	6/19/2017		0.76	IE	8.3	0.851	19.1	34.8
MW-27R	6/22/2017		0	IE	10.16	0.214	18.03	69.7
MW-28R	6/21/2017		0	51	8.75	0.161	18.96	36.8
MW-29D	6/20/2017		0	IE	8.66	1.88	16.06	20.1
MW-30D	6/19/2017		0	IE	7.6	2.43	15.75	7.6
MW-31D	6/23/2017		0	IE	7.81	0.794	21.09	21.2
MW-31D	8/3/2017		0	-186	7.91	1.4	17.38	35.6
MW-32D	6/19/2017		0	-134	8.33	2.18	22.97	99
MW-33D	6/21/2017		1.88	IE	7.81	3.42	17.53	9.1
MW-8R	6/22/2017		0	IE	7.64	2.83	16.74	3.5
RMW-11D	6/21/2017		7.87	IE	11.12	1.55	22.44	7.3
RMW-12D	6/20/2017		0	-76	9.09	0.791	18.28	23.1
RMW-13D	6/19/2017		0	IE	7.26	3.28	16.27	7.3
RMW-8D	6/21/2017		0	-165	9.28	0.903	19.58	11

IE = Instrument Error: ORP measurements from one field instrument were inconsistent with previous and subsequent sampling events and were rejected

Checked by: RCL 9/28/17

Table 2
 Validated Analytical Data
 2017 - Annual Groundwater Monitoring Event
 216 Paterson Plank Road Site
 Carlstadt, Bergen County, New Jersey

Sample Location		MW-5D 6/21/2017 N			MW-8R 6/22/2017 N			MW-8R 6/22/2017 FD			MW-11R 6/20/2017 N			MW-13R 6/20/2017 N			MW-14D 6/23/2017 N			MW-14D 8/3/2017 FD			MW-14R 6/23/2017 N			MW-14R 8/3/2017 N			MW-16D 6/22/2017 N			MW-17D 6/22/2017 N						
Parameter	NJ GWQS ¹	Unit	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL						
Volatile Organic Compounds																																						
1,1,1-Trichloroethane	30	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.22	J	0.5	0.5	U	0.5		
1,1,2,2-Tetrachloroethane	1	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,1,2-Trichloroethane	3	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,1-Dichloroethane	50	ug/L	30	J	25	0.91	U	0.5	0.84	U	0.5	1.8	J	1	0.5	UJ	0.5	NA		0.43	J	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	1.1	0.5	0.5	1.4	0.5	0.5	U	0.5
1,1-Dichloroethene	1	ug/L	110	J	25	0.5	U	0.5	0.5	U	0.5	3.1	J	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.73	0.5	0.5	0.2	J	0.5	0.5	
1,2,3-Trichlorobenzene	NS	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,2,4-Trichlorobenzene	9	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,2-Dibromo-3-chloropropane	0.02	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,2-Dibromoethane	0.03	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,2-Dichlorobenzene	600	ug/L	5.3	J	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,2-Dichloroethane	2	ug/L	86	J	25	0.31	J	0.5	0.27	J	0.5	9.7	J	1	0.12	J	0.5	NA		0.15	J	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	2.9	0.5	0.17	J	0.5	0.5		
1,2-Dichloropropane	1	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,3-Dichlorobenzene	600	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
1,4-Dichlorobenzene	75	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
2-Butanone	300	ug/L	250	UJ	250	5	U	5	5	U	5	10	UJ	10	2.1	J	5	NA		5	UJ	5	5	UJ	5	NA		5	UJ	5	5	U	5	5	U	5		
2-Hexanone	300	ug/L	250	UJ	250	5	U	5	5	U	5	10	UJ	10	5	J	5	NA		5	UJ	5	5	UJ	5	NA		5	UJ	5	5	U	5	5	U	5		
4-Methyl-2-pentanone	NS	ug/L	250	UJ	250	5	U	5	5	U	5	10	UJ	10	2.4	J	5	NA		5	UJ	5	5	UJ	5	NA		5	UJ	5	5	U	5	5	U	5		
Acetone	6000	ug/L	280	J	250	5.4	U	5.4	5	U	5	10	UJ	10	9.1	J	9.1	NA		6.1	UJ	6.1	5	UJ	5	NA		5	UJ	5	5	U	5	5	U	5		
Benzene	1	ug/L	12	J	25	0.5	U	0.5	0.5	U	0.5	0.53	J	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
Bromochloromethane	NS	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
Bromodichloromethane	1	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	U	0.5	0.5	U	0.5		
Bromoform	4	ug/L	25	UJ	25	0.5	U	0.5	0.5	U	0.5	1	UJ	1	0.5	UJ	0.5	NA		0.5	UJ	0.5	0.5	UJ	0.5	NA		0.5	U									

Table 2
Validated Analytical Data
2017 - Annual Groundwater Monitoring Event
216 Paterson Plank Road Site
Carlstadt, Bergen County, New Jersey

Notes:

1. NJDEP GWQS: Higher of the Practical Quantitation Limit and Ground Water Quality Criterion (November 2015).

2. Detected results above the stipulated NJDEP CWOS are **helded**.

*MW-21D is part of the monitoring program for the ISCO pilot test that commenced June 27, 2017.

Abbreviations:

Abbreviations:

NA = not analyzed
NS = no standard available

$\mu\text{g/l}$ = micrograms per liter

ug/E = micrograms per liter
mg/l = milligrams per liter

Qual = interpreted qualifier

BDL = reporting detection limit

RDE = Reporting detection limit

Qualifiers:

J = estimated result

J+ = estimated result; biased high
J- = estimated result; biased low

J- = estimated result, biased low
 U- = not detected above RDI

U = not detected above RDL

UJ = not detected above RDL, RDL is estimated

Created by: LRM 9/7/17
Checked by: MYS 9/8/17



Table 2
 Validated Analytical Data
 2017 - Annual Groundwater Monitoring Event
 216 Paterson Plank Road Site
 Carlstadt, Bergen County, New Jersey

Sample Location		MW-18D 6/22/2017 N			MW-19D 6/22/2017 N			MW-19R 6/22/2017 N			MW-20D 6/19/2017 N			MW-20R 6/19/2017 N			MW-21D* 6/23/2017 N			MW-21R 6/22/2017 N			MW-22D 6/21/2017 N			MW-23R 6/20/2017 N			MW-24D 6/20/2017 N			MW-24R 6/20/2017 N			MW-25D 6/23/2017 N		
Parameter	NJ GWQS ¹	Unit	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL					
Volatile Organic Compounds																																					
1,1,1-Trichloroethane	30	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.19	J	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,1,2,2-Tetrachloroethane	1	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,1,2-Trichloroethane	3	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,1-Dichloroethane	50	ug/L	0.89		0.5	0.21	J	0.5	0.5	U	0.5	8		0.5	0.5	U	0.5	NA			0.5	U	0.5	0.53	J	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.61	J	0.5	NA	
1,1-Dichloroethene	1	ug/L	0.1	J	0.5	0.5	U	0.5	0.5	U	0.5	10		0.5	0.5	U	0.5	NA			0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.58	J	0.5	NA				
1,2,3-Trichlorobenzene	NS	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2,4-Trichlorobenzene	9	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2-Dibromo-3-chloropropane	0.02	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2-Dibromoethane	0.03	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2-Dichlorobenzene	600	ug/L	0.11	J	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2-Dichloroethane	2	ug/L	0.16	J	0.5	0.2	J	0.5	0.17	J	0.5	10		0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,2-Dichloropropane	1	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,3-Dichlorobenzene	600	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
1,4-Dichlorobenzene	75	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
2-Butanone	300	ug/L	5	U	5	5	U	5	5	U	5	5	U	5	5	U	5	NA			5	U	5	5	UJ	5	1.2	J	5	5	UJ	5	5	UJ	5	NA	
2-Hexanone	300	ug/L	5	U	5	5	U	5	5	U	5	5	U	5	5	U	5	NA			5	U	5	5	UJ	5	5	UJ	5	5	UJ	5	NA				
4-Methyl-2-pentanone	NS	ug/L	5	U	5	5	U	5	5	U	5	5	U	5	5	U	5	NA			5	U	5	5	UJ	5	5	UJ	5	5	UJ	5	NA				
Acetone	6000	ug/L	5	U	5	5	U	5	5	U	5	5	U	5	5	U	5	NA			5	U	5	5	UJ	5	6.8	UJ	5	5	UJ	5	5	UJ	5	NA	
Benzene	1	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	2.3		0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
Bromochloromethane	NS	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
Bromodichloromethane	1	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5	U	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	NA	
Bromoform	4	ug/L	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	0.5	U	0.5	NA			0.5																

Table 2
Validated Analytical Data
2017 - Annual Groundwater Monitoring Event
216 Paterson Plank Road Site
Carlstadt, Bergen County, New Jersey

Notes:

1. NJDEP GWQS: Higher of the Practical Quantitation Limit and Ground Water Quality Criterion (November 2015).

2. Detected results above the stipulated NJDEP CWSQ are bolded.

*MW 21D is part of the monitoring program for the ISCO Pilot test that commenced June 27, 2017.

*MW-21D is part of

Abbreviations:

NA = not analyzed

NS = no standard available
ug/l = micrograms per liter

ug/L = micrograms per liter
mg/l = milligrams per liter

mg/L = milligrams per liter

Qual = interpreted qualifier
RDL = reporting detection limit

RDL = reporting detection limit

Qualifiers:

J = estimated result

J+ = estimated result; biased high
J- = estimated result; biased low

J- = estimated result; biased low

U = not detected above RDL

UJ = not detected above RDL, RDL is estimated

Created by: LRM 9/7/17
Checked by: MYS 9/8/17



Table 2
Validated Analytical Data
2017 - Annual Groundwater Monitoring Event
216 Paterson Plank Road Site
Carlstadt, Bergen County, New Jersey

Sample Location		MW-25D 8/3/2017			MW-25R 6/23/2017			MW-25R 8/3/2017			MW-26D 6/19/2017			MW-27R 6/22/2017			MW-28R 6/21/2017			MW-29D 6/20/2017			MW-30D 6/19/2017			MW-31D 6/23/2017			MW-31D 8/3/2017			MW-32D 6/19/2017			MW-32D 6/19/2017					
N=Normal, FD=Field Duplicate	Sample Date	N			N			N			N			N			N			N			N			N			N			N			N					
Parameter	NJ GWQS ¹	Unit	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL					
Volatile Organic Compounds																																								
1,1,1-Trichloroethane	30	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	21	J	25	0.64	J	1	NA			2.5	UJ	2.5	1.3	0.5	1.2	J	2.5	0.5	UJ	0.5			
1,1,2,2-Tetrachloroethane	1	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,1,2-Trichloroethane	3	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.18	J	0.5	2.5	0.5	UJ	0.5				
1,1-Dichloroethane	50	ug/L	0.8	J	0.5	NA			0.5	UJ	0.5	0.3	J	0.5	0.5	U	0.5	0.5	UJ	0.5	290	J	25	14	1	NA			19	J	2.5	26	1	29	2.5	0.64	J	0.5		
1,1-Dichloroethene	1	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.6		0.5	0.5	U	0.5	0.5	UJ	0.5	160	J	25	50	5	NA			2.5	UJ	2.5	67	J+	1	80	J+	2.5	0.57	J	0.5
1,2,3-Trichlorobenzene	NS	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,2,4-Trichlorobenzene	9	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,2-Dibromo-3-chloropropane	0.02	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,2-Dibromoethane	0.03	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,2-Dichlorobenzene	600	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	0.2	J	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,2-Dichloroethane	2	ug/L	1.7	J	0.5	NA			0.5	UJ	0.5	0.25	J	0.5	0.5	U	0.5	0.5	UJ	0.5	95	J	25	32	1	NA			7.5	J	2.5	53	J	1	57	2.5	1.6	J	0.5	
1,2-Dichloropropane	1	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.41	J	0.5	2.5	0.5	UJ	0.5				
1,3-Dichlorobenzene	600	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
1,4-Dichlorobenzene	75	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
2-Butanone	300	ug/L	5	UJ	5	NA			5	UJ	5	5	U	5	5	UJ	5	250	UJ	250	10	U	10	NA			25	UJ	25	5	UJ	5	25	U	25	5	UJ	5		
2-Hexanone	300	ug/L	5	UJ	5	NA			5	UJ	5	5	U	5	5	UJ	5	250	UJ	250	10	U	10	NA			25	UJ	25	5	U	5	25	U	25	5	UJ	5		
4-Methyl-2-pentanone	NS	ug/L	5	UJ	5	NA			5	UJ	5	5	U	5	5	UJ	5	250	UJ	250	10	U	10	NA			25	UJ	25	5	U	5	25	U	25	5	UJ	5		
Acetone	6000	ug/L	10	UJ	10	NA			22	J	5	5	U	5	5	UJ	5	250	UJ	250	10	U	10	NA			25	UJ	25	5	UJ	5	25	U	25	5.5	UJ	5.5		
Benzene	1	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	13	J	25	1.3	1	NA			16	J	2.5	11	0.5	10	2.5	0.5	UJ	0.5					
Bromochloromethane	NS	ug/L	0.5	UJ	0.5	NA			0.5	UJ	0.5	0.5	U	0.5	0.5	UJ	0.5	25	UJ	25	1	U	1	NA			2.5	UJ	2.5	0.5	U	0.5	2.5	0.5	UJ	0.5				
Bromodichloromethane																																								

Table 2
Validated Analytical Data
2017 - Annual Groundwater Monitoring Event
216 Paterson Plank Road Site
Carlstadt, Bergen County, New Jersey

2. Detected results above the stipulated NJDEP CWOS are helded.

*MW-21D is part of the monitoring program for the LSCO Pilot test that commenced June 27, 2017.

MW-21D is p... Abbreviations:

RDL = reporting detection limit

Qualifiers:

Jt = estimated result

J+ = estimated result; biased high
J- = estimated result; biased low

J- = estimated result, biased low
U = not detected above BDI

U = not detected above RDL

UJ = hot detected above RDL, RDL is estimated

Created by: LRM 9/7/11
Checked by: MYS 9/8/11

Table 2
 Validated Analytical Data
 2017 - Annual Groundwater Monitoring Event
 216 Paterson Plank Road Site
 Carlstadt, Bergen County, New Jersey

Parameter	Sample Location			RMW-8D			RMW-11D			RMW-12D			RMW-13D						
	N=Normal	FD=Field Duplicate	Sample Date	6/21/2017	N	6/21/2017	N	6/20/2017	N	6/19/2017	N	Result	Qual	RDL	Result	Qual	RDL	Result	Qual
Volatile Organic Compounds																			
1,1,1-Trichloroethane	30	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,1,2,2-Tetrachloroethane	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,1,2-Trichloroethane	3	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,1-Dichloroethane	50	ug/L	0.12	J	0.5	1.3	J	0.5	0.39	J	0.5	11							
1,1-Dichloroethene	1	ug/L	0.5	UJ	0.5	1.1	J	0.5	0.36	J	0.5	1.1							
1,2,3-Trichlorobenzene	NS	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,2,4-Trichlorobenzene	9	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,2-Dibromo-3-chloropropane	0.02	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,2-Dibromoethane	0.03	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,2-Dichlorobenzene	600	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,2-Dichloroethane	2	ug/L	0.5	UJ	0.5	6	J	0.5	0.49	J	0.5	15							
1,2-Dichloropropane	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,3-Dichlorobenzene	600	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
1,4-Dichlorobenzene	75	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
2-Butanone	300	ug/L	5	UJ	5	5	UJ	5	5	UJ	5	10	U	10					
2-Hexanone	300	ug/L	5	UJ	5	5	UJ	5	5	UJ	5	5.9	J	10					
4-Methyl-2-pentanone	NS	ug/L	5	UJ	5	5	UJ	5	5	UJ	5	10	U	10					
Acetone	6000	ug/L	5	UJ	5	5	UJ	5	5	UJ	5	10	U	10					
Benzene	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1.2		1					
Bromochloromethane	NS	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Bromodichloromethane	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Bromoform	4	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Bromomethane	10	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Carbon Disulfide	700	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.24	J	0.5	1	U	1					
Carbon Tetrachloride	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Chlorobenzene	50	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1.7		1					
Chloroethane	5	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.52	J	1					
Chloroform	70	ug/L	0.5	UJ	0.5	0.23	J	0.5	0.5	UJ	0.5	1	U	1					
Chloromethane	NS	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
cis-1,2-Dichloroethene	70	ug/L	12	J	0.5	10	J	0.5	2.9	J	0.5	14		1					
cis-1,3-Dichloropropene	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.6	J	1					
Cyclohexane	NS	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Dibromochloromethane	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Dichlorodifluoromethane	1000	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Ethylbenzene	700	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Freon 113	20000	ug/L	0.5	UJ	0.5	0.24	J	0.5	0.2	J	0.5	0.4	J	1					
Isopropylbenzene	700	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
m,p-Xylenes	1000	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Methyl Acetate	7000	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Methyl Cyclohexane	NS	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Methyl tert-Butyl Ether	70	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Methylene Chloride	3	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
o-Xylene	1000	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Styrene	100	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	1	U	1					
Tetrachloroethene	1	ug/L	0.49	J	0.5	3.5	J	0.5	0.66	J	0.5	0.18	J	1					
Toluene	600	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.79	J	1					
trans-1,2-Dichloroethene	100	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.79	J	1					
trans-1,3-Dichloropropene	1	ug/L	0.5	UJ	0.5	0.5	UJ	0.5	0.5	UJ	0.5	0.44	J	1					
Trichloroethene	1	ug/L	3.1	J	0.5</td														

Table 2
 Validated Analytical Data
 2017 - Annual Groundwater Monitoring Event
 216 Paterson Plank Road Site
 Carlstadt, Bergen County, New Jersey

Parameter	Sample Location		RMW-8D			RMW-11D			RMW-12D			RMW-13D		
	Sample Date	N	6/21/2017	N	6/21/2017	N	6/20/2017	N	6/19/2017	N	6/19/2017	N	6/19/2017	
Total Metals														
Aluminum	200	ug/L	NA			NA			NA			NA		
Antimony	6	ug/L	NA			NA			NA			NA		
Arsenic	3	ug/L	NA			NA			NA			NA		
Barium	6000	ug/L	NA			NA			NA			NA		
Beryllium	1	ug/L	NA			NA			NA			NA		
Cadmium	4	ug/L	NA			NA			NA			NA		
Calcium	NS	ug/L	NA			NA			NA			NA		
Chromium	70	ug/L	NA			NA			NA			NA		
Cobalt	100	ug/L	NA			NA			NA			NA		
Copper	1300	ug/L	NA			NA			NA			NA		
Iron	300	ug/L	NA			NA			NA			NA		
Lead	5	ug/L	NA			NA			NA			NA		
Magnesium	NS	ug/L	NA			NA			NA			NA		
Manganese	50	ug/L	NA			NA			NA			NA		
Mercury	2	ug/L	NA			NA			NA			NA		
Nickel	100	ug/L	NA			NA			NA			NA		
Potassium	NS	ug/L	NA			NA			NA			NA		
Selenium	40	ug/L	NA			NA			NA			NA		
Silver	40	ug/L	NA			NA			NA			NA		
Sodium	50000	ug/L	NA			NA			NA			NA		
Thallium	2	ug/L	NA			NA			NA			NA		
Vanadium	NS	ug/L	NA			NA			NA			NA		
Zinc	2000	ug/L	NA			NA			NA			NA		
Dissolved Gases														
Ethane	NS	ug/L	NA			NA			NA			1.3	J	
Ethene	NS	ug/L	NA			NA			NA			80	6	
Methane	NS	ug/L	NA			NA			NA			530	4	
General Chemistry Parameters														
Alkalinity, Bicarbonate as CaCO ₃	NS	mg/L	NA			NA			NA			57.3	5	
Alkalinity, Carbonate as CaCO ₃	NS	mg/L	NA			NA			NA			5	U	
Alkalinity, Hydroxide (OH)	NS	mg/L	NA			NA			NA			5	U	
Alkalinity, Total	NS	mg/L	NA			NA			NA			57.3	5	
Chloride	250	mg/L	NA			NA			NA			1170	120	
Nitrate as N	10	mg/L	NA			NA			NA			0.1	U	
Nitrite as N	1	mg/L	NA			NA			NA			0.12	U	
Nitrogen, Total Kjeldahl	NS	mg/L	NA			NA			NA			1.2	0.2	
Sulfate	250	mg/L	NA			NA			NA			63.5	3	
Sulfide	NS	mg/L	NA			NA			NA			1	U	
Total Organic Carbon	NS	mg/L	NA			NA			NA			2.2	1	

Notes:

1. NJDEP GWQS: Higher of the Practical Quantitation Limit and Ground Water Quality Criterion (November 2015).

2. Detected results above the stipulated NJDEP GWQS are **bolded**.

*MW-21D is part of the monitoring program for the ISCO Pilot test that commenced June 27, 2017

Abbreviations:

NA = not analyzed

NS = no standard available

ug/L = micrograms per liter

mg/L = milligrams per liter

Qual = interpreted qualifier

RDL = reporting detection limit

Qualifiers:

J = estimated result

J+ = estimated result; biased high

J- = estimated result; biased low

U = not detected above RDL

UJ = not detected above RDL, RDL is estimated

Created by: LRM 9/7/17

Checked by: MYS 9/8/17



